U.S. DEPARTMENT OF ENERGY | Office of Science

SciDAC Software Overview

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First: Some Information about ASCR

ASCR Overview

- **SciDAC is funded out of the Office of Advanced Scientific Computing Research (ASCR), one of the six science program offices in the Office of Science (SC)**
- **ASCR is composed of two divisions:**
  - Research Division: Applied Math, Computer Science, Data and Visualization, Next Generation Networks, SciDAC
  - Facilities Division:Oak Ridge Leadership Computing Facility (OLCF), Argonne Leadership Computing Facility (ALCF), National Energy Research Scientific Computing Center (NERSC), Energy Sciences Network (ESnet), Innovative & Novel Computational Impact on Theory and Experiment (INCITE), ASCR Leadership Computing Challenge (ALCC)
  - ASCR on the web: http://science.energy.gov/ascr
  - Located in Germantown, MD

ASCR Overview

- **Research Division - Dr. William Harrod, Director**
  - Applied Mathematics - “Focuses on mathematical research and software that impact the future of HPC”
  - Computer Science - “Supports research that enables computing at extreme scales and the understanding of extreme scale data”
  - Next Generation Networking - “Research, develop, test and deploy advanced network technologies critical in addressing networking capabilities unique to DOE’s science mission”
  - SciDAC - More on that later

ASCR Overview

- **Facilities Division - Dr. Daniel Hitchcock, Director**
  - OLCF - Jaguar, Cray XT5, 2.33 PF (#2/500)
  - ALCF - Intrepid, IBM Blue Gene/P, 557 TF (#13/500)
  - NERSC - Hopper, Cray XE6, 1.28 PF (#5/500)
  - ESNet - "Provides direct connections to more than 30 DOE sites at 10 GB/sec"
  - INCITE - "Seek out computationally intensive, large-scale research projects with the potential to significantly advance key areas in science and engineering"
  - ALCC - "Allocates up to 30% of computational resources for special situations of interest to DOE"

SciDAC Software Overview (Background)

- **Developed by Benjamin Grover (LLNL), Osni Marques (LBL) and Bill Spotz (SNL)**
- **Large amount of data exists regarding SciDAC, but no central location to see relationships**
- **Individuals are left searching Google for information regarding SciDAC software and SciDAC contacts**
- **Most SciDAC data is at a high level**
- **Needed a webpage as a central "practitioners" resource**

SciDAC Software Overview (Background)

- **Originally two sites: SciDAC documentation and SciDAC "under the hood", merged into one resource**
- **Data driven website using web2py (http://web2py.com/)**
- **Goal: allow access to information, downloads, contacts and documentation and their relationships to each other**

SciDAC Software Overview (Background)

- **Organized around the "phases" of SciDAC**
  - Original Program Plan (2000)
  - SciDAC-1 (2001-2006)
  - SciDAC-2 (2006 - 2011)
  - SciDAC-3 (2011-2016)
- **Majority of content is located on SciDAC (2006-2011) site**
- **Other areas are links to PDFs or information regarding funding opportunities (SciDAC-3)**

SciDAC (2006-2011)

- **Organized around three central areas (Centers and Institutes, Science Applications Partnerships, Investigators):**
  - Centers and Institutes, broken down further by capability areas:
    - Graph Algorithms
    - Hardware Management
    - Languages and Code Generation
    - Meshing Tools
    - Performance Analysis and Tuning
    - Solvers and Preconditioners
    - Visualization and Data Analysis

SciDAC (2006-2011)

- **Organized around three central areas (Centers and Institutes, Science Applications Partnerships, Investigators):**
  - Science Application Partnerships:
    - Organized as a sortable table
    - Links to PIs, Institutions and Partner Offices
    - Relevant links to Partnership websites if they exist

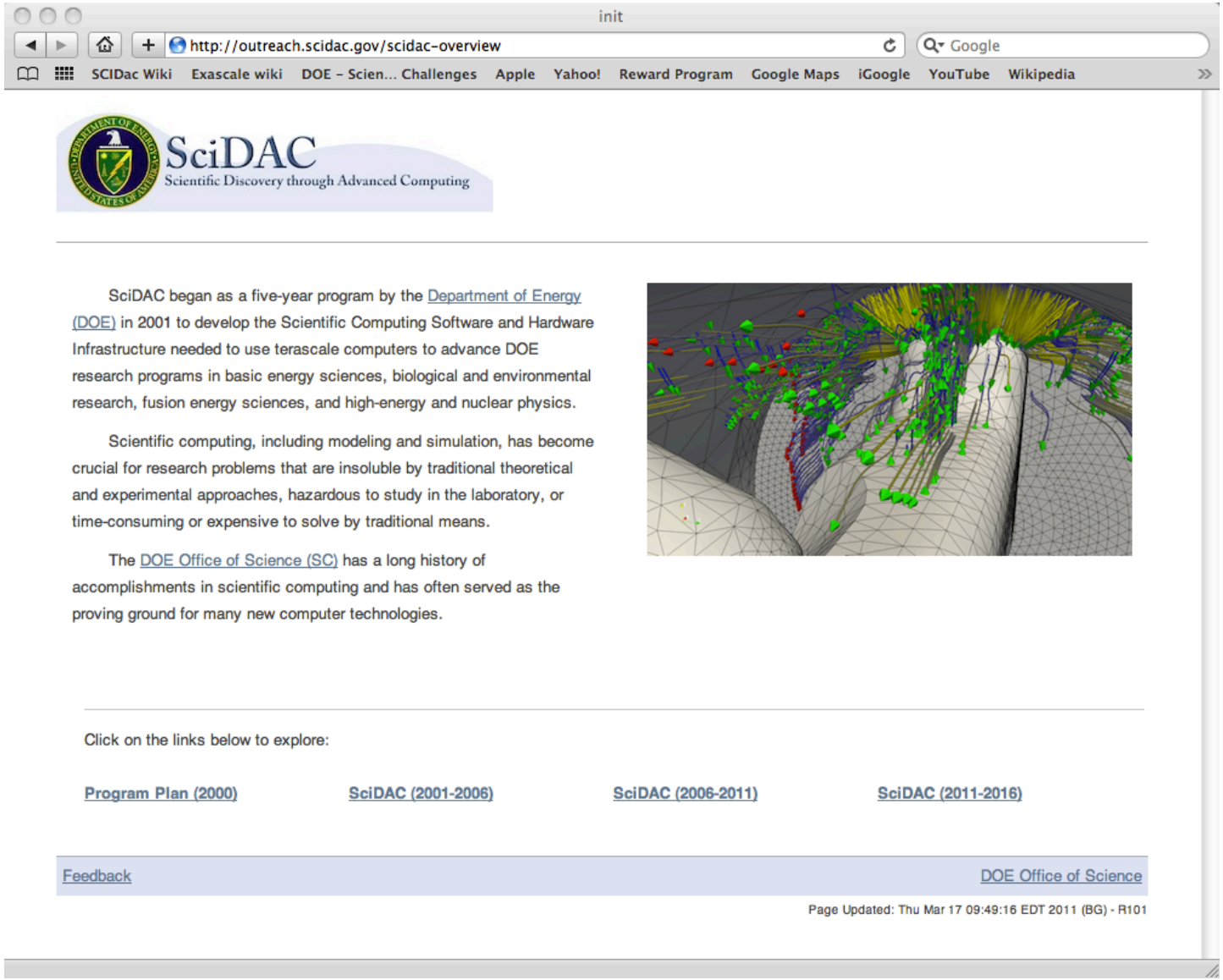
SciDAC (2006-2011)

- **Organized around three central areas (Centers and Institutes, Science Applications Partnerships, Investigators):**
  - Investigators
    - Listing of the people of SciDAC
    - Sortable by last name and by institutional affiliation
    - Lists the efforts they are affiliated with
- **All information is cross referenced to other areas of the site (where appropriate)**
- **Site search**

Information - SciDAC Overview pages

- **Contact:**
  - Benjamin Grover, benjy.grover@science.doe.gov, 301-903-9938
  - Bill Spotz, wfspotz@sandia.gov, 505-845-0170
  - Osni Marques, oamarques@ascr.doe.gov, 510-486-5290
- **URL: https://outreach.scidac.gov/scidac-overview**
- **Feedback link located at the bottom left of page. We welcome your feedback to make the site as useful as possible.**

Demo


init
http://outreach.scidac.gov/scidac-overview
Google
SCIDac Wiki
Exascale wiki
DOE - Scien... Challenges
Apple
Yahoo!
Reward Program
Google Maps
iGoogle
YouTube
Wikipedia
SciDAC
Scientific Discovery through Advanced Computing
SciDAC began as a five-year program by the Department of Energy (DOE) in 2001 to develop the Scientific Computing Software and Hardware Infrastructure needed to use terascale computers to advance DOE research programs in basic energy sciences, biological and environmental research, fusion energy sciences, and high-energy and nuclear physics.
Scientific computing, including modeling and simulation, has become crucial for research problems that are insoluble by traditional theoretical and experimental approaches, hazardous to study in the laboratory, or time-consuming or expensive to solve by traditional means.
The DOE Office of Science (SC) has a long history of accomplishments in scientific computing and has often served as the proving ground for many new computer technologies.
Click on the links below to explore:
Program Plan (2000)
SciDAC (2001-2006)
SciDAC (2006-2011)
SciDAC (2011-2016)
Feedback
DOE Office of Science
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